Bowdoin College	**)**	**Departmental**
Cumberland County	**)**	**Findings of Fact and Order**
Brunswick, ME	**)**	**Air Emission License**
A-76-71-K-M	**)**	**Amendment #3**

After review of the air emissions license minor revision application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A., Section 344 and Section 590, the Department finds the following facts:

I. REGISTRATION

A. Introduction

Bowdoin College in Brunswick, Maine is licensed to operate emission sources associated with their educational facility. Bowdoin College has submitted a minor revision request for the replacement of the generator located in the central heating plant. Bowdoin College has also submitted an additional minor revision request to switch from #6 fuel oil to #2 fuel oil in the central heating plant and to revise the fuel oil limit from 1,200,000 gallons/yr of #6 fuel to 1,300,000 gallons/yr of #2 fuel.

Bowdoin College is currently operating under air emission license A-76-71-G-R (issued January 12, 1999) and amendments A-76-71-I-A (July 31, 2001) and A-76-71-J-M (April 18, 2002). The facility is licensed for three main boilers, twelve smaller boilers/hot water heaters, and ten emergency generators.

B. Equipment

This minor revision addresses the following equipment:

Main Boilers ◊

Equipment	Maximum Capacity (MMBtu/hr)	Maximum Firing Rate (gal/hr)	Fuel Type, % sulfur
Boiler 1	45.1	322.1	#2 fuel oil, 0.35%
Boiler 2	29.3	209.3	#2 fuel oil, 0.35%
Boiler 3	48.6	347.1	#2 fuel oil, 0.35%

◊ The Boilers were previously licensed for #6 fuel oil at 0.5% sulfur. The change to #2 fuel oil from #6 fuel oil requires minor adjustments to the burners. The updated firing rates are listed in the table above. Boiler 4 is now renamed boiler 3.

Emergency Generator

Equipment	Power Output (kW)	Maximum Capacity (MMBtu/hr)	Maximum Firing Rate (gal/hr)	Fuel Type, % sulfur
Heating Plant Generator *	200	2.09	14.9	diesel, 0.05%

* This is a replacement of the current 135 kW heating plant generator.

C. Application Classification

The application submitted by Bowdoin College has been classified as a minor revision and has been processed under Chapter 115 of the Department's regulations. The minor revision thresholds of 4 tons per year of any one regulated pollutant and 8 tons per year total regulated pollutants will not be exceeded, as seen in the following tables:

Generator Replacement

Pollutant	Licensed Emissions from Current Generator (tpy)	Emissions from Proposed Generator (tpy)	Total Emissions Increase (tpy)
PM	0.098	0.158	0.06
PM_{10}	0.098	0.158	0.06
SO_2	0.015	0.026	0.01
NO_X	1.395	2.251	0.86
CO	0.3	0.485	0.18
VOC	0.115	0.179	0.06

Emissions for the generator were calculated based on 500 hours of operations. The current generator is rated at 135 kW and the proposed generator is rated at 200 kW.

Fuel Replacement: #6 to #2 fuel oil

Pollutant	Current Licensed Emissions from #6 Fuel Oil in the Main Boilers (tpy)	Proposed Licensed Emissions from #2 Fuel Oil in the Main Boilers (tpy)	Total Emissions Increase (tpy)
PM	18	18.2	0.2
PM_{10}	18	18.2	0.2
SO_2	47.1	32.03	-15.07
NO_X	45.0	27.3	-17.7
CO	3.0	3.25	0.25
VOC	0.17	0.13	-0.04

Current licensed emissions were based on 1.2 MMgal/year of #6 fuel oil. Proposed licensed emissions were based on 1.3 MMgal/year of #2 fuel oil.

II. MINOR REVISION DESCRIPTION

A. Generator

The current heating plant generator is proposed to be replaced with a new Onan 200 kW (2.09 MMBtu/hr) generator. The generator will be used for emergency power in the central heating plant.

Best Available Control Technology (BACT) for the proposed generator is the firing of diesel fuel oil with a maximum sulfur content of 0.05% and a 500 hour/year operating limit. The BACT emission limits for the emergency generator are based on the following:

PM/PM_{10} – 0.31 lb/MMBtu : AP-42, Table 3.3-1
SO_2 – combustion of 0.05% sulfur diesel fuel oil
NOx – 4.41 lb/MMBtu: AP-42, Table 3.3-1
CO – 0.95 lb/MMBtu: AP-42, Table 3.3-1
VOC – 0.35 lb/MMBtu: AP-42, Table 3.3-1

Opacity from the boiler shall not exceed 20% opacity on a 6 minute block average basis, except for no more than 2 six minute block averages in a 3 hour block period.

B. Replacement of #6 fuel oil with #2 fuel oil

Bowdoin College has requested the replacement of #6 fuel oil with #2 fuel oil in the main boilers in the central heating plant (boilers 1, 2, and 3). Currently, the #6 fuel oil limit is 1,200,000 gallons/year. Bowdoin College is proposing to increase

the limit of #2 fuel oil to 1,300,000 gallons/year to provide the facility with an equal heating value. With the proposed limit, the total facility-wide #2 fuel use cap will be 1,600,000 gallons/year (the current license limits the facility to 300,000 gallons #2 fuel oil/year).

There will be minor adjustments made to the burners to efficiently fire the #2 fuel oil. The adjustments do not constitute a 'modification' requiring BACT. The fuel switch also will not trigger additional requirements under New Source Performance Standards (NSPS).

The emissions for the main boilers firing #2 fuel oil were based on the following:
PM/PM_{10} – 0.20 lb/MMBtu - boilers 1 and 3: Chapter 103
0.12 lb/MMBtu - boiler 2: Chapter 103
SO_2 – combustion of 0.35% sulfur #2 fuel oil
NO_X – 0.3 lb/MMBtu: manufacturers data
CO – 5 lb/1000 gal: AP-42, Table 1.3-1
VOC – 0.2 lb/1000 gal: AP-42, Table 1.3-1

C. Annual Facility Emissions

Annual emissions from Bowdoin College were calculated using 1,600,000 gallons/year of #2 fuel oil, 250,000 gallons/year propane, and each of the emergency generators operating 500 hours/year. Emissions from the facility shall be limited to the following, based on a 12 month rolling total:

Total Allowable Annual Emissions for the Facility
(used to calculate the annual license fee)

	PM	PM_{10}	SO_2	NO_X	CO	VOC
#2 Fuel Oil Use	22.4	22.4	39.5	33.6	4	0.16
Propane Use	1.41	1.41	negl	1.75	0.24	0.06
Generator Emissions	1.05	1.05	0.18	17.9	3.87	1.47
TOTAL	**24.9**	**24.9**	**39.7**	**53.3**	**8.1**	**1.7**

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards,
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License amendment A-76-71-K-M subject to the conditions found in Air Emission License A-76-71-G-R, in the subsequent amendment A-76-71-I-A and A-76-71-J-M, and in the following conditions:

The following shall replace condition (16) in air emission license A-76-71-G-R once the burners have been converted to firing #2 fuel oil:

(16) **Boiler 1**

A. Boiler 1 (rated at 45.1 MMBtu/hr) shall fire #2 fuel oil with a maximum sulfur content of 0.35% by weight.

B. Emissions from Boiler 1 shall not exceed the following:

Boiler 1 Emission Limits

Pollutant	lb/MMBtu	lb/hr
PM	0.2	9.0
PM_{10}	--	9.0
SO_2	---	15.9
NO_X	0.3	13.5
CO	---	1.6
VOC	---	0.06

The following shall replace condition (17) in air emission license A-76-71-G-R once the burners have been converted to firing #2 fuel oil:

(17) **Boiler 2**

A. Boiler 2 (rated at 29.3 MMBtu/hr) shall fire #2 fuel oil with a maximum sulfur content of 0.35% by weight.

B. Emissions from Boiler 2 shall not exceed the following:

Boiler 2 Emission Limits

Pollutant	lb/MMBtu	lb/hr
PM	0.12	3.5
PM_{10}	--	3.5
SO_2	---	10.3
NO_X	0.3	8.8
CO	---	1.0
VOC	---	0.04

C. Bowdoin College shall comply with the notification and reporting requirements of Federal New Source Performance Standards (NSPS) 40 CFR Part 60, Subpart Dc.

The following shall replace condition (18) in air emission license A-76-71-G-R once the burners have been converted to firing #2 fuel oil:

(18) **Boiler 3**

A. Boiler 3 (rated at 48.6 MMBtu/hr) shall fire #2 fuel oil with a maximum sulfur content of 0.35% by weight.

B. Emissions from Boiler 3 shall not exceed the following:

Boiler 3 Emission Limits

Pollutant	lb/MMBtu	lb/hr
PM	0.2	9.7
PM_{10}	--	9.7
SO_2	---	17.1
NO_X	0.3	14.6
CO	---	1.7
VOC	---	0.07

The following shall replace condition (20) in air emission license A-76-71-G-R, as amended in A-76-71-I-A:

(20) **Fuel Oil**

A. The annual use of #6 fuel oil in the three main boilers shall be limited to 1,200,000 gal/yr, on a 12 month rolling total basis until such time that the burners are changed to allow the firing of #2 fuel oil. After the switch takes place, no #6 fuel oil shall be fired in the main boilers. While firing #6 fuel oil prior to the switch, the sulfur content shall not exceed 0.5%

sulfur. Fuel records shall be kept documenting the amount of fuel fired on a monthly and 12 month rolling total basis, and the sulfur content of the fuel.

B. Bowdoin College shall be limited to 1,600,000 gallons/year of #2 fuel oil on a 12 month rolling total basis, once the main boilers are converted to fire #2 fuel oil. The sulfur content of the fuel shall be limited to 0.35%. Prior to the main boilers' conversion, the #2 fuel oil shall be limited to 300,000 gallons/year. Fuel records shall be kept documenting the amount of fuel fired on a monthly and 12 month rolling total basis, and the sulfur content of the fuel.

C. Bowdoin College may combust up to a total of 500 gallons/year of specification waste oil generated on site, based on a 12 month rolling total. Bowdoin College shall maintain records of the amount of specification waste oil burned in the boilers.

Condition (26) in air emission license amendment A-76-71-I-A shall be deleted (re: #2 fuel oil limit).

NEW CONDITIONS

(30) **Heating Plant Generator**

A. The proposed central heating plant emergency generator (200 kW, 2.09 MMBtu/hr) may replace the current heating plant emergency generator. Once replaced, the current generator shall be removed from service. The proposed generator shall not exceed the following limits:

Pollutant	Lb/hr
PM	0.63
PM_{10}	0.63
SO_2	0.10
NO_X	9.0
CO	1.94
VOC	0.71

B. The heating plant emergency generator shall fire diesel fuel with a sulfur content not to exceed 0.05%. Fuel records shall be maintained documenting sulfur content.

C. The heating plant emergency generator shall be limited to 500 hours/year, based on a 12 month rolling total. An hour meter shall be installed and shall

be operated on the generator. Records shall be maintained documenting generator use on a monthly and 12 month rolling total basis.

D. Opacity from the generator shall not exceed 20% opacity on a 6 minute block average, except for no more than 2 six minute block averages in a 3 hour period.

(31) The term of this amendment shall be concurrent with the term of air emission license A-76-71-G-R.

DONE AND DATED IN AUGUSTA, MAINE THIS DAY OF 2003.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:_____
DAWN R. GALLAGHER, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: May 8, 2003
Date of application acceptance: May 8, 2003

Date filed with the Board of Environmental Protection: _____

This Order prepared by Kathleen E. Molokie, Bureau of Air Quality.